NEWS REPORT

H. H. Gardner

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NATIONAL RESEARCH COUNCIL

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Editor: WALLACE W. ATWOOD, JR.

Editorial Office: 2101 Constitution Ave., Washington 25, D. C.

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Frontispiece–Architect's drawing of the proposed new wing (left) of the National Academy of Sciences building, the gift of the Equitable Life Assurance Society of the United States (*see* news note p. 42).

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NEWS REPORT

National Academy of Sciences National Research Council

VOLUME IX *May–June 1959* NUMBER 3

The International Geophysical Year in Retrospect[1]

WALLACE W. ATWOOD, JR.

Director, Office of International Relations

ON DECEMBER 31, 1958, the International Geophysical Year, widely known as the IGY, came to an end. For a period of 18 months starting on July 1, 1957, and throughout the 5 years of planning that had gone before, a unique example of international cooperation was given to the world. In spite of national rivalries, ideological tensions, and wars both hot and cold, scientists of East and West—and those of neutral nations in between—pooled their skills and their learning to push out the frontiers of knowledge for the benefit of all mankind. Through their concerted efforts quantities of basic scientific data were gathered, which will form the basis of future research projects for years to come. Important new discoveries were made regarding man's environment, the earth itself, the oceans, and the atmosphere. Through the launching of artificial earth satellites the IGY brought man to the threshold of a new era of exploration: the exploration of outer space.

To bring all this about required the services of some 30,000 scientists and technicians and as many amateur observers, representing most of the nations on earth. Some 4,000 primary sites and several thousand auxiliary ones covered every part of the world, extending from pole to pole and reaching into many hitherto inaccessible spots. Expeditions went to some of the farthest reaches of the globe, and scientists from countries whose political leaders were snarling at each other worked on in amity, like the United States and Soviet Union weathermen who jointly staffed meteorological stations in the Antarctic.

Although the IGY was conceived and carried out by scientists working through their nongovernmental international organizations, the success of the undertaking depended in large measure on the support given by governments all over the world. To a greater or lesser extent, public funds were used to finance the various national IGY programs. In many instances governments provided logistics for material and personnel. And each cooperated by facilitating the necessary exit from one country and entry into another of scientists engaged in the work and expedited the movement through customs and other national barriers of scientific equipment to be placed and utilized abroad. In these ways governments actively participated in the IGY.

The precedents for the International Geophysical Year were the First Polar Year of 1882–83 and its successor, the Second Polar Year of 1932–33. In 1950 a proposal was

[1] Reprinted from the U. S. Department of State *Bulletin*, Vol. 40, pp. 682–689, illus., May 11, 1959.

made that another period of international and interdisciplinary research be scheduled at the 25-year interval (1957–58) instead of the 50-year interval. There were three good reasons for this advance scheduling: *1*) The warehouse of basic data essential to progress in science was nearly empty; *2*) travel at supersonic speeds and the rapid development of new communications systems posed problems which required basic information concerning the earth, the oceans, and the upper atmosphere; and *3*) a period of unusual activity on the surface of the sun was predicted for 1957–58, which would provide an excellent opportunity to observe some of the phenomena that affect man's environment on planet earth.

Role of International Council of Scientific Unions

Planning went forward under the guidance of the International Council of Scientific Unions (ICSU). This is a nongovernmental organization which helps to coordinate activities in international science. It comprises 13 international scientific unions, from which it takes its name, together with 45 member nations, each represented by a suitable adhering organization. Generally, the adhering national unit is the national academy of science or research council or a similar body; for the United States it is the National Academy of Sciences.

The over-all plan for the IGY called for studying 3 large areas of science, covering 11 different disciplines. The first of the three areas related to studies of the earth itself; the second covered weather and climate, including the events and processes on the earth's surface and in the lower atmosphere that make up the important "heat and water budget"; the third took in the upper atmosphere, extending out to the sun and on into outer space itself.

Within this general plan the scientists of each country were invited to set forth the research they would undertake as their part of the IGY. In the United States it was the National Academy of Sciences that called together a group of scientists to plan a national program. This group was called the U.S. National Committee for the International Geophysical Year. Similar committees were established in other countries, each charged with the responsibility of developing a national program to be carried out in 1957-58. Then, in a series of meetings called by ICSU's Comité spécial de l'année géophysique internationale (CSAGI), the various national plans were coordinated by voluntary adjustment to make sure that all important geographic areas and scientific disciplines were suitably covered. These meetings for coordination were held annually during the 5-year period of preparation and contributed immeasurably to the success of the entire undertaking.

Financing the meetings of CSAGI and the international secretariat of the IGY in Brussels was the responsibility of ICSU. The amount needed averaged about $50,000 a year and was obtained from the United Nations Educational, Scientific and Cultural Organization (UNESCO) and from the national IGY participating committees. It is significant to note that ICSU's request for support was oversubscribed and a substantial balance remains to carry forward the post-IGY program of publication.

In every activity connected with United States participation in the IGY, there was nationwide, exemplary cooperation by all members of the scientific community. Universities, research institutions, industrial laboratories, foundations, and individual scientists participated unselfishly in implementing the program developed by the U.S. National Committee. At the same time the National Science Foundation took over the important task of fund raising and of representing the needs of the IGY before the U.S. Congress and executive agencies of the Government. A total of $43 million was appropriated by Congress in support of the scientific aspects of the United States IGY program. Industrial, commercial, and other organizations and various agencies of the Government provided help. For example, the establishment and maintenance of scientific stations in Antarctica, the study of the oceans, and the exploration of outer space by rockets and satellites would have been impossible without the full support and participation of the military services, which provided scientific and technical personnel, planes and ships, essential equipment, housing facilities, and many other necessary supplies and services. Similarly, it would have

been impossible to arrange certain of the important cooperative programs if the Department of State, through its Office of the Science Adviser, had not contributed its experienced hand in the conduct of bilateral negotiations with foreign governments.

Principle of Political Noninterference

The number of nations whose scientists participated in the IGY grew constantly, from 26 in July 1954 to a total of 66 three years later. Every inhabited continent and all parts of the world were represented. Large and small nations were able to help their scientists participate in the IGY, each group making a contribution consistent with such factors as available facilities, trained personnel, and financial resources.

There was one incident that threatened the purely scientific character of this international cooperative effort. In the second half of the IGY the Chinese Communist authorities at Peiping, who had previously permitted their scientists to join this effort, withdrew after scientists from Taiwan were accepted by CSAGI into the IGY. The Peiping scientists, prompted by political motivations of their regime, had asked that scientists from Taiwan be barred, but CSAGI refused to allow the IGY cooperative enterprise to be despoiled by this attempt at political pressure.

At this point it is relevant to call attention to one of ICSU's basic principles recently reaffirmed at the 1958 general assembly held in Washington, namely that ICSU and its affiliated bodies welcome participation in their activities of scientists from any country or territory and that such participation shall not carry any implication whatsoever with respect to recognition of the government of the country or territory concerned. This principle made possible the virtually universal enrollment of national scientific communities in the IGY. It showed up on occasion in such anomalies as the presence of scientists from the Soviet Union, Poland, and Communist China at the 1956 CSAGI meeting at Barcelona; had the orientation of the meeting been political, this would have been impossible. The Barcelona meeting, of course, took place before Peiping spoiled the otherwise perfect record of political noninterference.

Availability of Information Assured

ICSU also insists on free and prompt dissemination of information. Therefore it was mutually agreed from the start that the data gathered during the IGY would be available to the scientists and researchers of all nations. This agreement provided assurance that the maximum gain would come from the collected information, since everyone who might have use for it would also have access to it.

To facilitate access to all information CSAGI established three World Data Centers, to which observations would be sent. One center was set up in the United States, the second in the U.S.S.R., and the third in Western Europe, with branches of the latter in Japan and Australia.

One of the primary reasons for the IGY, advanced by the scientists, was the need to observe certain geophysical phenomena simultaneously from many localities scattered over the surface of the earth. To attain such simultaneity of observations would require worldwide cooperation and also a worldwide communications system that would link together the IGY observers wherever they might be—in Antarctica, high in the Andes of South America, at sea on an oceanographic vessel, or at observation stations distributed over five continents.

Accordingly the IGY planners in cooperation with the International Scientific Radio Union—URSI (Union radio scientifique internationale)—developed a World Days warning-alert communications system with headquarters at Fort Belvoir, 15 miles south of Washington, D.C. Certain days known as World Days were selected in advance for intensive worldwide observation of particular phenomena. Other days were selected on short notice as interesting phenomena developed, such as sudden flareups on the surface of the sun. Occasionally an alert was issued when a fast-developing storm was spotted. This permitted observers over a large area to track the course of the storm and thus learn a little more about the problems of weather forecasting.

The role of ICSU in the IGY was very real although sometimes overlooked by those unfamiliar with the pattern of international cooperation developed by ICSU over the

past 40 years. This role and the sequence of IGY operations are shown in figure 1. National planning and international program coordination are featured at the left in the chart; research, evaluation of data, and publication of results are shown at the right.

Post-IGY Activities

Without ICSU and its member unions the IGY might never have been initiated and the ambitious post-IGY programs, currently under way, might have been delayed for many years. It was ICSU with its 45-nation membership and 13 unions which met in Washington in October 1958 to chart post-IGY activities. On that occasion it was decided to establish a new Special Committee for Inter-Union Cooperation in Geophysics, to be known as the SCG, to guarantee continuance of international collaboration in geophysics along the lines begun in CSAGI under the IGY. This new committee will be immediately concerned with publication of the results of the IGY. In addition, ICSU established the Special Committee on Oceanic Research (SCOR), the Special Committee on Antarctic Research (SCAR), the Committee on Contamination by Extra-Terrestrial Exploration (CETEX), the Committee on Space Research (COSPAR), and the International Service for World Days (IWDS).

Thus ICSU, even before the accomplishments of the IGY have been fully evaluated, has charted new explorations into the unknown. These programs will be carried forward by the scientists of many nations working through their national scientific institutions and with the assistance of their respective governments. The several committees of ICSU will coordinate the work in the same manner employed so successfully during the IGY.

Some Scientific Achievements

It will take many years to analyze and evaluate the data gathered during the IGY and to learn what this additional fund of scientific information may mean in practical effects on man's way of living. However, it might be well to take note of a few of the results that have appeared. What follows cannot in any sense be comprehensive, nor even representative perhaps, but it may give some idea of the magnitude and importance of the scientific accomplishments of the IGY. It may also, here and there, reveal some of the ways in which international scientific cooperation extended from planning into actual operations.

The most comprehensive attack yet on the mysteries of Antarctica, joined in by Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, the Union of South Africa, the United Kingdom, the United States, and the U.S.S.R., has started to reveal the actual face of that continent. Beneath the ice masses, it has been found, lies a complex of mountainous islands many of which would be ocean covered if the ice mantle were suddenly to melt. Signs of a major separation between the east and west halves of the continent also have been discerned. A concomitant discovery is that the total of the world's ice and snow, most of which lies in this region, is 40 percent greater than previously thought. The new estimate considerably changes what is known of the heat and water balance of the earth, which is of critical importance to present and future climate.

In addition, through the cooperation of observers from all the nations conducting operations in Antarctica, the first comprehensive census of antarctic weather has been completed. Precise data on temperature (measured as low as –124° F.), pressure, humidity, and wind direction and velocity will permit a more accurate gauging of the influence this region has on weather throughout the world.

Scientists from many nations participated in the IGY oceanographic research program. Countries from the Northern Hemisphere joined those bordering the Indian Ocean in studies of that ocean; South American and Asian countries shared in Pacific Ocean research; 350 tide-gauge stations were operated by no fewer than 25 nations; and the 80 research vessels that took part in the cruise portions of the oceanographic program represented 20 different countries.

Sea-level changes were measured and the oceanic water budget studied. In addition, important discoveries were made concerning the behavior of certain ocean currents. Three major countercurrents were located,

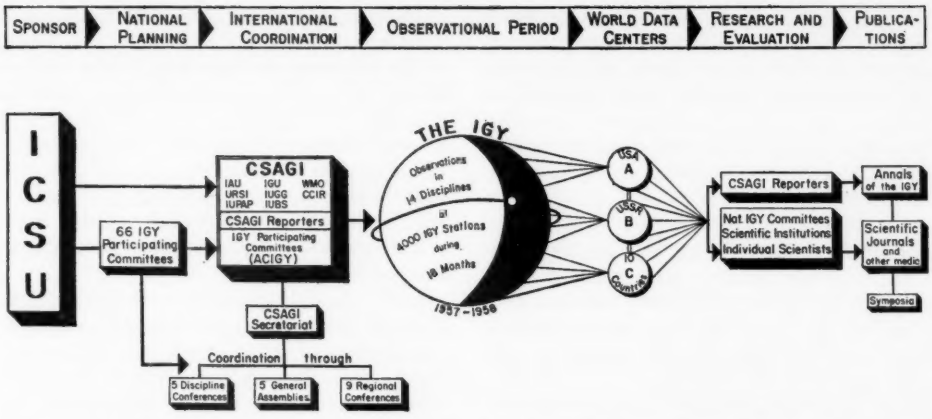

FIGURE 1.—The pattern of IGY operation developed by CSAGI in accordance with guidelines established by ICSU. International coordination of national programs was accomplished by scientists from IGY participating committees at meetings sponsored by CSAGI. The scientific data obtained during the 18-month observational period have been deposited in three World Data Centers, from which they can be obtained for the purpose of research and evaluation by scientists of any country. The final phase of the operation is the publication of results in the *Annals of the International Geophysical Year* and other scientific journals.

clocked, and measured: one in the Atlantic flowing deep beneath the Gulf Stream and two in the Pacific. All three shed new light on the nature of the oceans, on their effects on climate and weather, and on potential food resources that may become vital to rapidly increasing populations in young nations striving for orderly development.

Deep trenches have been located beneath the ocean off the west coast of South America and in the Arctic Basin. The bottom of a vast region in the southeast Pacific has been found to bear a sludge rich in manganese, iron, cobalt, and copper, potentially of such great value that its exploitation may not be very far off.

Although the goal of the IGY was geophysical research, study in other fields of science was almost inevitable. For example, one of the by-products of the oceanographic studies was the discovery in the ocean depths of a live specimen of a supposedly extinct presnail. The chance to study this creature will help biologists fill in the background of evolutionary history.

Whether his belief was manifested through superstition, expressed in religion, or pursued through science, man seems always to have recognized the pervasive influence of the sun. During the IGY scientists of 33 nations at preselected vantage points throughout the world kept the sun under perpetual watch. As a result there now exists an unmatched record in data and photographs of the solar flares and all other discernible activity on the sun. With this record the solar processes can be analyzed and correlated with terrestrial phenomena, some of which, like the effects of radio communication, have long been known but not fully understood.

Monitoring of auroral activity by cameras, radar, and other equipment has turned up data that seem to bear on the emission of cosmic rays from the sun during flares. Joint United States–New Zealand observations of the aurora have led to the conclusion that lithium is present in the high atmosphere in addition to the elements previously known.

With the help of modern technology to supplement traditional methods, significant discoveries have been made regarding the upper atmosphere. More than 300 instrumented rockets have measured density, pressure, temperature, and composition up to a height of some 250 miles. One result has been the discovery in the lowest region of the ionosphere of X-rays which apparently cause increased electrical activity that can sometimes black out radio communications; studies made during an eclipse of the sun

suggest its corona as the source of these rays. Cosmic-ray trajectories reveal strong deviations from what should be expected according to the accepted description of the earth's magnetic field; it appears now that the latter is pulled somewhat askew by the effects of magnetic fields surrounding other bodies in space.

In addition a large region of powerful radiation trapped within the earth's magnetic field has recently been located 1,000 to 3,000 miles above the earth's surface and given the name of the Van Allen Radiation Belt. This radiation helps to explain certain geomagnetic variations and auroral displays; its presence must be taken into account in the preparation for space travel.

Impact of the IGY

The launching of satellite vehicles during the IGY as scientific probes into space opened a new era of exploration and discovery. At this stage scientists are still gathering information—information that adds to an understanding of the origin of the solar system, perhaps of matter itself. A long step beyond, but nevertheless a step no longer out of reach or sensible thought, is man's own penetration of new worlds, at least of the moon and the nearby planets. How far in the future this development lies is not yet clear, but the use of experimental animals in recent test flights suggests that the first space trips by man may be imminent.

The stimulation to thought and imagination which has come with the opening of new horizons through the IGY has few parallels in recent history. It has renewed interest in study and research, and more people have come to recognize the importance of pure science, not just its applications in technology. In the United States the educational system is responding to the impetus generated by the IGY. Parents, school boards, and legislators have become more aware of the importance of science training for the youth of the country. By the same token there has been a rising tide of demands that highly qualified students be given better preparation for careers in science. The result could well be a substantial change for the better in the educational systems of the country.

Citizens generally have become more keenly aware of the contributions being made by scientists and by scientific institutions. The notable leadership provided by the National Academy of Sciences has brought deserved recognition for that body. Similarly, the National Science Foundation and the scientific organizations of the country, both governmental and private, have acquired greater stature and importance in the public eye.

It has been suggested in high tribunals that the IGY has provided a pattern of international cooperation which should be emulated. If this is true, it is because the scientists involved were men of good will and because they developed together the procedures necessary to achieve their common objectives. At no time did the scientists allow political differences to block their course. Through their national academies and other scientific institutions they interested their respective governments in the IGY plans and obtained the cooperation and financial support which they required. In this manner the IGY scientists developed a team which possessed the strength and prestige necessary to carry through the most ambitious program of scientific exploration the world has ever known.

These well-tested methods, developed by ICSU and its unions and so effectively employed during the IGY, are ideally suited for the furtherance of international cooperation in science. For this reason it may be hoped that the United Nations and its specialized agencies, when they contemplate the initiation of international scientific activities, will call upon organizations such as ICSU for advice and assistance. If this should happen, the IGY, in addition to making a significant contribution to science and human welfare, will have brought to the United Nations a valuable tool for the conduct of international scientific relations.

For the United States, the IGY has further demonstrated the significance of scientific factors in formulating and executing foreign policy. This is apparent in the day-to-day work of the Department of State and in pronouncements of congressional committees and the executive branch of the Government. This greater interest in science on the part of Government has been

developing ever since the first atomic bomb was dropped in 1945, but it was the IGY with its associated scientific and technological achievements (especially those of the Soviet Union) which clearly indicated that science could facilitate the attainment of peaceful objectives of foreign policy.

It is gratifying to record that in 1950, more than 8 years ago, the Department of State recognized the growing importance of science by creating the Office of the Science Adviser and by appointing science attachés to several embassies in Western Europe. These actions were taken following a careful study which resulted in the publication of the Berkner report entitled *Science and Foreign Relations*. Although the Department's science office was drastically curtailed in 1955, it since has been revived and strengthened. Within the next few months it is expected that a total of eight science officers will be stationed at United States missions overseas.

Additional developments indicating the growing recognition of science are seen in the creation of the President's Science Advisory Committee late in 1957 and the establishment of the National Aeronautics and Space Administration in October 1958. Both actions may be traced either directly or indirectly to activities of the IGY which pushed forward the frontiers of science with unusual speed and opened the door to outer space with such force as to jolt the nations of the world.

This is the story of the IGY in retrospect. It was a good program, carefully planned and magnificently executed. Through its successes the world has gained new scientific knowledge of untold wealth. It also opened the eyes of many persons to the significance of science in national and world affairs. But even more important to the future of mankind on this planet are the happiness and satisfaction that the scientists found in working together. As a consequence, peaceful cooperation among all nations is a little closer to realization.

SCIENCE NEWS

ANNUAL MEETING NATIONAL ACADEMY OF SCIENCES

The ninety-sixth annual meeting of the National Academy of Sciences was held in Washington, April 27–29, with nearly two hundred and fifty members in attendance. The program included scientific sessions on Monday, April 27, and Wednesday, April 29; the presentation of Academy medals followed by scientific exhibits and demonstrations and an informal reception on Monday evening for medalists and guests; business sessions on Tuesday, April 28, for the election of officers and members and the transaction of other business; and the annual Academy dinner on Tuesday evening, preceded by the President's reception.

In addition to the sessions for contributed papers, there were four symposia of invited papers. On Monday morning Roger Revelle of the Scripps Institution of Oceanography served as chairman of the "Symposium on the Deep Sea." The speakers were Henry M. Stommel of Woods Hole Oceanographic Institution, John A. Knauss of Scripps Institution of Oceanography, John C. Swallow of the National Institution of Oceanography at Sussex, England, Fritz Koczy of the University of Miami Marine Laboratory, and Robert J. Menzies of the Lamont Geological Observatory. The papers covered dynamical models of oceanic circulation, subsurface currents of the equatorial Pacific, direct measurements of deep currents, natural radiation elements and the deep sea circulation, and fauna of the abyss.

On Monday afternoon, a symposium on Physics, Chemistry, and Biology of the Atmosphere was held under the chairmanship of Horace R. Byers of the University of Chicago. Jule Charney of the Massachusetts Institute of Technology, Sverre Petterssen of the University of Chicago, Bert Bolin of the University of Stockholm, Lester Machta of the U. S. Weather Bureau, and Rene J. Dubos of the Rockefeller Institute presented

papers dealing with hydrodynamics of the atmosphere and numerical weather prediction, heat exchange and weather forecasting, atmospheric chemistry and broad geophysical relationships, air pollution and radioactive circulation problems, and bioclimatology.

The third symposium was held on Wednesday morning and dealt with the scientific effects of artificially introduced radiations at high altitudes. Under the chairmanship of Richard W. Porter of the General Electric Company, six papers were delivered on the Argus experiment, satellite observations of radiation artificially injected into the geomagnetic field, measurement of trapped electrons from a nuclear device by sounding rockets, theory of geomagnetically trapped electrons from an artificial source, and optical, electromagnetic and satellite observations of high-altitude nuclear detonations. The presentations were made by:

NICHOLAS CHRISTOFILOS, University of California at Livermore
JAMES A. VAN ALLEN, State University of Iowa (with Carl E. McIlwain and George H. Ludwig as co-authors)
MAJ. LEW ALLEN, JR., U. S. Air Force, Kirtland Air Force Base, New Mexico
CAPT. JOSEPH A. WELCH, JR., U. S. Air Force, Kirtland Air Force Base, New Mexico
PHILIP NEWMAN, Air Force Cambridge Research Center
ALLEN M. PETERSON, Stanford University and Stanford Research Institute

The fourth symposium on Problems in Space Exploration was arranged in cooperation with the American Physical Society and the National Aeronautics and Space Administration. The opening session on Wednesday afternoon was under the chairmanship of Bruno Rossi of the Massachusetts Institute of Technology. Two more sessions were held on Thursday, April 30, the first day of the Washington meeting of the American Physical Society. Robert Jastrow of the National Aeronautics and Space Administration and H. C. Urey of the University of California at La Jolla served as chairmen of these sessions.

Each session included four papers and a roundtable discussion. The participants in the three sessions, including the speakers and the chairmen of the roundtable discussions, were:

HERBERT FRIEDMAN, U. S. Naval Research Laboratory
THOMAS GOLD, Harvard University
LEO GOLDBERG, University of Michigan
ROBERT JASTROW, National Aeronautics and Space Administration
G. P. KUIPER, University of Chicago
HOMER E. NEWELL, National Aeronautics and Space Administration
EUGENE PARKER, University of Chicago
BRUNO ROSSI, Massachusetts Institute of Technology
JOHN A. SIMPSON, University of Chicago
LYMAN SPITZER, JR., Princeton University
J. W. TOWNSEND, National Aeronautics and Space Administration
H. C. UREY, University of California at La Jolla
G. DE VAUCOULEURS, Harvard University
FRED L. WHIPPLE, Smithsonian Astrophysical Observatory

Forty-two contributed papers on a wide variety of subjects were presented in the other scientific sessions. Abstracts of these were printed in *Science*, Vol. 129, pp. 1282–1290, May 8, 1959.

Six Academy medals and awards were presented at the Monday evening ceremony. Martin Wiggo Johnson, Scripps Institution of Oceanography, received the Agassiz medal for his original contribution to the science of oceanography. The Comstock Prize for the most important discovery or investigation in electricity, magnetism, or radiant energy was awarded to Charles Hard Townes of Columbia University for his investigations in microwave spectroscopy and his pioneering work on microwave amplification by stimulated emission of radiation (MASER). The Daniel Giraud Elliot Medal, awarded for the most meritorious work in zoology or paleontology published each year, was presented to Herbert Friedman, Acting Head Curator of the Department of Zoology, U. S. National Museum, for his book, "The Honey-Guides."

Tracy Morton Sonneborn, Distinguished Service Professor of Zoology at Indiana University, received the Kimber Genetics Award in recognition of his fundamental contributions to the study of the genetics of micro-organisms, and Eugene Lindsay Opie of The Rockefeller Institute received the Jessie Stevenson Kovalenko Medal for outstanding contributions to the medical sciences. The Mary Clark Thompson Medal, awarded for most important serv-

ices to geology and paleontology, was presented *in absentia* to Roman Kozlowski of the University of Warsaw for his fundamental contributions to paleontology. At Professor Kozlowski's request the medal was accepted for him by Preston Cloud of the U. S. National Museum.

Sarwono Prawirohardjo, President of the Council for Sciences of Indonesia, and Tadeusz Kotarbinski, President of the Polish Academy of Sciences, were guests of honor at the Academy dinner on Tuesday evening. Other honored guests were James F. Oates, Jr., and Fordyce B. St. John, President and a Director respectively of the Equitable Life Assurance Society; Lt. Gen. James H. Doolittle, Chairman of the Board of Directors of the Space Technology Laboratories, who was awarded the Public Welfare Medal for "eminence in the application of science to the public welfare;" and Edwin B. Wilson, who was celebrating the 40th anniversary of his election to the Academy.

A highlight of the dinner was the joint announcement by Mr. Oates and Dr. Bronk of the gift from the Equitable Life Assurance Society to the Academy for the construction of a new wing of the Academy–Research Council building (see p. 42).

The election of officers and new members on Tuesday morning is reported elsewhere in this issue of News Report. The afternoon business session on Tuesday was devoted to the presentation of reports and the discussion of Academy undertakings.

While the members were attending the business sessions, their lady guests enjoyed a tour of the Corcoran Gallery of Art which was celebrating the 100th anniversary of its founding. After lunch the ladies visited the U. S. National Arboretum, noted for the plantings of azaleas which are among the most extensive in the Nation and which were in bloom at the time.

SYMPOSIUM ON BASIC RESEARCH

The Academy–Research Council, in cooperation with the American Association for the Advancement of Science (AAAS) and the Alfred P. Sloan Foundation, sponsored a Symposium on Basic Research, May 14–16, in the Caspary Auditorium of the Rockefeller Institute. The symposium was attended by over 200 scientists, research administrators, educators, and other invited guests.

At a dinner held on the first evening, the President of the United States addressed those attending the symposium and some 250 additional guests on the value of basic research to the nation. Other speakers at the dinner were James R. Killian, Jr., Special Assistant to the President for Science and Technology, and Crawford H. Greenewalt, president of E. I. du Pont de Nemours and Company. Detlev W. Bronk, president of the host Institute and of the National Academy of Sciences, presided.

Warren Weaver, symposium coordinator and vice president of the Rockefeller Foundation for the Natural and Medical Sciences, said:

> It is the purpose of this symposium to set forth and examine with candor the facts concerning the support of basic research in our country; to inquire realistically what are the blocks which prevent our doing what we all say we believe is important; to make concrete suggestions as to ways in which the situation can be improved; and in general to proclaim the fundamental faith which we have in the importance of free and imaginative basic research, and to do this with such competence and vigor as will have a national impact.

It was the feeling of those attending the meeting that these goals had been met.

Dr. Bronk opened the symposium on Thursday morning, May 14, with a short address of welcome. George W. Beadle, California Institute of Technology, then chaired the opening session on general aspects of basic research. Speakers were J. Robert Oppenheimer, Institute for Advanced Study; Alan T. Waterman, National Science Foundation; and William O. Baker, Bell Telephone Laboratories.

Thursday afternoon's session, led by John S. Dickey, Dartmouth College, was devoted to basic research in the liberal arts college, state university and private university. Speakers were Laurence M. Gould, Carleton College; Conrad A. Elvehjem, University of Wisconsin; and Lee A. DuBridge, California Institute of Technology.

James A. Shannon, National Institute of Health, served as chairman of the Friday morning session on basic research in government laboratories, industrial labora-

tories, and private research institutes. The speakers were Allen V. Astin, National Bureau of Standards; James B. Fisk, Bell Telephone Laboratories; and Merle A. Tuve, Carnegie Institution of Washington.

Support available for basic research from Government, industry, and private philanthropy was discussed by: Paul E. Klopsteg, National Science Foundation; Robert E. Wilson, former Chairman of the Board, Standard Oil Company of Indiana; and Robert S. Morison, The Rockefeller Foundation. Lloyd V. Berkner, Associated Universities Inc., served as chairman.

Each morning and afternoon session closed with a panel discussion, led by the chairman and including the speakers and four additional panelists. All the panelists and a small number of invited guests met on Saturday morning, May 16, under the chairmanship of Julius Stratton, Massachusetts Institue of Technology, to examine more closely the principal points of discussion and to summarize the conclusions of the previous two days.

The content of the final discussion session will be incorporated within the published proceedings of the symposium, under the editorial responsibility of Daele Wolfe, Executive Officer of the AAAS.

NEW WING FOR ACADEMY–RESEARCH COUNCIL BUILDING

A gift from the Equitable Life Assurance Society of the United States for the construction of a new wing of the Academy–Research Council building was announced at the annual dinner of the Academy on Tuesday, April 28, by James F. Oates, Jr., President and Chairman of the Society, and Detlev W. Bronk, President of the Academy. This gift made during the Society's 100th anniversary will provide for the erection of the Equitable Life Assurance Society Hall of the Life Sciences, in which will be housed the many scientific activities of the Academy–Research Council in the fields of biology and medicine (*see* Frontispiece).

The present building, which is generally considered one of the most beautiful in Washington, was constructed in 1924 with funds provided by the Carnegie Corporation of New York and dedicated 35 years ago by President Coolidge. It is situated on Constitution Avenue, adjacent to the new State Department Building now under construction, and facing the memorial to Abraham Lincoln who was the founder of the Academy.

Architects for the new hall will be Harrison and Abramovitz, who have been associated with the design of many notable buildings, such as the Rockefeller Center, the Lincoln Square project in New York, and the United Nations building. Mr. Harrison, senior member of the firm, was as a young man associated with Bertram Goodhue in the design of the present Academy building.

Dr. Bronk made the following comment on the Equitable gift:

> Erection of this new Hall of the Academy to house the medical and life sciences will be of great value to our nation. It is eminently appropriate that the Equitable Life Assurance Society thus contribute to the work of the Academy, for we are both private organizations devoted to the public welfare.
>
> Both organizations are deeply concerned with the furtherance of those sciences which prolong life and increase health. We are both national in scope. In the beautiful center of our national capital, the Hall of the building provided by the Equitable Centennial gift will symbolize your service to the welfare of the people of our nation and will enable us to increase our service as we, too, begin our second century.

When the Academy–Research Council building was erected in 1924, it was planned to accommodate additional wings as the need developed and funds became available. With the greatly increased scope of the Academy's work, more space has been urgently needed and many activities of the Academy–Research Council have had to be housed in widely scattered locations throughout Washington.

The work of the Academy–Research Council is carried on by more than a thousand committees comprising scientists who voluntarily give their time and represent all fields of science; they are served by a full-time staff of more than 1,100. More than $10,000,000 a year is provided for the work of the Academy by private foundations and by contracts and grants from the Federal Government.

ELECTION OF OFFICERS AND MEMBERS NATIONAL ACADEMY OF SCIENCES

At the annual business meeting of the Academy on April 28, Hugh L. Dryden, Deputy Administrator of the National Aeronautics and Space Administration, was elected to a second four-year term as Home Secretary of the Academy. Roger Adams, Research Professor of Chemistry at the University of Illinois, and William V. Houston, President of Rice Institute, were elected members of the Council of the Academy for three-year terms to succeed I. I. Rabi, Columbia University, and F. E. Terman, Stanford University, who will complete their terms on the Council on June 30, 1959.

The following new members and foreign associates were elected to the Academy:

New Members of the Academy:

PHILIP HAUGE ABELSON, Director, Geophysical Laboratory, Carnegie Institution of Washington

WALKER BLEAKNEY, Professor of Physics, Princeton University

DAVID MAHLON BONNER, Professor of Microbiology, Yale University

TOM WILKERSON BONNER, Professor of Physics, The Rice Institute

WALTER HOUSER BRATTAIN, Research Physicist, Bell Telephone Laboratories, Inc.

LEO BREWER, Professor of Chemistry, University of California at Berkeley

FRANK BRINK, JR., Professor and Member, The Rockefeller Institute

JENS CHRISTIAN CLAUSEN, former Staff Member, Department of Plant Biology, Carnegie Institution of Washington

SAMUEL EILENBERG, Professor of Mathematics, Columbia University

JOHN DOUGLASS FERRY, Professor of Chemistry, University of Wisconsin

KURT OTTO FRIEDRICHS, Professor of Applied Mathematics, New York University

HIRAM BENTLEY GLASS, Professor of Biology, Johns Hopkins University

MELVILLE JEAN HERSKOVITS, Professor of Anthropology, Northwestern University

HERMAN MORITZ KALCKAR, Professor of Biochemistry, Johns Hopkins University

KONRAD BATES KRAUSKOPF, Professor of Geochemistry, Stanford University

I. MICHAEL LERNER, Professor of Genetics, University of California at Berkeley

RUDOLPH LEO BERNHARD MINKOWSKI, Staff Member, Mount Wilson and Palomar Observatories

HARRY FERDINAND OLSON, Director, Acoustical and Electromechanical Research Laboratory, Radio Corporation of America

CARL PFAFFMANN, Professor of Psychology, Brown University

RICHARD JOEL RUSSELL, Professor of Physical Geography, Louisiana State University

JOHN ALEXANDER SIMPSON, Professor of Physics, University of Chicago

DEAN STANLEY TARBELL, Professor of Chemistry, University of Rochester

HENRY TAUBE, Professor of Chemistry, University of Chicago

JAMES ALFRED VAN ALLEN, Professor of Physics, State University of Iowa

CECIL JAMES WATSON, Professor of Medicine, University of Minnesota

GREGOR WENTZEL, Professor of Physics, University of Chicago

FRED LAWRENCE WHIPPLE, Director, Astrophysical Observatory, Smithsonian Institution, and Professor of Astronomy, Harvard University

WILLIAM BARRY WOOD, JR., Professor of Microbiology, Johns Hopkins University

CLARENCE MELVIN ZENER, Director, Westinghouse Research Laboratories

RAYMOND ELLIOTT ZIRKLE, Professor of Radiobiology, University of Chicago

Foreign Associates:

VICTOR AMAZASPOVICH AMBARTSUMIAN, Director, Burakan Observatory, Erevan, Armenia, U.S.S.R.

SIR EDWARD CRISP BULLARD, Assistant Director of Research, Department of Geodesy and Geophysics, University of Cambridge, Cambridge, England

MAX HARTMANN, Director Emeritus, Max Planck Institute for Biology, Tübingen, Germany

WILLIAM VALLANCE DOUGLAS HODGE, Master of Pembroke College, and Lowndean Professor of Astronomy and Geometry, Cambridge, England

INDONESIAN SCIENCE COUNCIL

As part of an over-all plan to strengthen the organization of the Council for Sciences of Indonesia, Arifin Bey, Deputy Director of the Council, will spend two years in the United States in study and research. During this period he will be a member of the staff of the Office of International Relations of the Academy–Research Council and will continue his advanced academic work at Georgetown University. As a member of the Office of International Relations Mr. Arifin will have an opportunity to become acquainted with the administrative procedures of the Academy–Research Council. Arrangements are being made for him to spend some time with other organizations concerned with areas of special interest to the Indonesian Council. Mr. Arifin's stay in the United States is supported by a grant to the Indonesian Council from the Ford Foundation.

The Council for Sciences of Indonesia was incorporated by Parliamentary Act in

1956 and is subsidized by the Government through the Ministry of Education and Culture. The President of the Republic appoints the nine members of the Board who serve for two years and are eligible for reelection. The Advisory Committee to the Board is composed of 40 members appointed by the Minister of Education and Culture.

Like many of the continental science councils, the Indonesian Council embraces the natural sciences as well as the social sciences and the humanities. The functions of the Council are as follows: *a*) to advance and promote in the widest sense of the word efforts and activities in the field of the sciences serving the interest of the nation in particular and the interests of peace and mankind in general; *b*) to advise the government, on its own initiative or upon request, on problems, projects, and activities relating to the sciences.

VISITING RESEARCH SCIENTISTS PROGRAM

A second group of awards under the expanded Visiting Research Scientists Program, which the Academy–Research Council is administering for the International Cooperation Administration, has been made, and 20 additional participants have arrived in the United States since March 10. The following list gives the name and country of origin of the recipients as well as the field and location of their research:

From Argentina:

Salomon Freiberg, Engineering—University of California at Berkeley, with W. W. Soroka

From Australia:

Clive K. Coogan, Chemical physics—University of Illinois, with H. S. Gutowsky

Ian D. Marshall, Epidemiology—University of California at Berkeley, with William C. Reeves

David White, Virology—National Institutes of Health, with Robert J. Huebner

From Brazil:

João Maria Lisboa, Forestry—Louisiana State University, with P. Y. Burns

From Costa Rica:

Gil Chaverri R., Soil chemistry—Iowa State College, with W. H. Pierre

From Denmark:

Mogens G. Simesen, Physiological chemistry—University of California at Davis, with Max Kleiber

From Eire:

John O'Sullivan, Organic chemistry—Sloan Kettering Institute for Cancer Research, with Ralph K. Barclay

From France:

Wladimir Nesteroff, Geology—Columbia University, with Rhodes W. Fairbridge

From Germany:

Martin Kretzscher, Physics—University of California at Berkeley, with A. C. Helmholz

Gottfried H. Landwehr, Physics—University of Illinois, with John Bardeen

From Greece:

Sotirios G. Iatridis, Internal medicine—University of North Carolina, with John H. Ferguson

From Iceland:

Einar I. Siggeirsson, Horticulture—North Dakota Agricultural College, with E. P. Lana

From Israel:

Zehara Hershenzon, Plant pathology—University of Minnesota, with J. J. Christensen

From Pakistan:

A. Q. M. Bazlul Karim, Agricultural chemistry—University of California at Davis, with Perry R. Stout

From Malaya:

Huang Han-Chao, Physics—University of California at Berkeley, with L. B. Loeb

From South Africa:

Adolf Lutsch, Physics—Brown University, with R. B. Lindsay

Alistair M. Stephen, Organic chemistry—University of Minnesota, with F. Smith

From Sweden:

Börje A. Norén, Soil microbiology—University of Wisconsin, with Kenneth B. Raper

From Thailand:

Skon Rohitayodhin, Microbiology—University of Pittsburgh, with W. M. Hammon.

MARITIME TRANSPORTATION RESEARCH SYMPOSIUM AND CORRELATION CONFERENCE

The third annual Maritime Transportation Research Symposium was held on May 13 at the Academy–Research Council building. These annual symposia have been organized by the Maritime Cargo Transportation Conference (MCTC) to satisfy the need for an exchange of ideas and findings among both research personnel and executives concerned with systems analysis in the shipping industry. Although meetings of this type are characteristic of older and better established scientific fields where

they supply an important stimulus to research, the inception of these symposia on a continuing basis was the first such effort in maritime systems-research.

Following welcoming remarks by Rear Adm. E. G. Fullinwider, Director of MCTC, six papers were presented. Each described recently completed work in a different area of maritime transportation research. Discussions, comments, and questions from the audience followed each paper. The diversity of interests among the 150 participants was reflected in the variety of topics presented.

Chairman of the morning session was Richard Parkhurst, former Commissioner of the U. S. Maritime Commission and now consultant to the Boston and Maine Railroad and a member of the Board of MCTC. The following papers were presented during the morning session:

"Cargo Forecasting," by Ivan Bloch, Ivan Bloch and Associates

"Operational Simulation of a Freighter Fleet," by Foster L. Weldon, Matson Navigation Company

"Automatic Data-Processing System for Maritime Transportation," by Col. R. D. Hoisington, U. S. Army Transportation Corps, and H. J. Pratt, U. S. Army Transportation Terminal Command, Atlantic.

Col. Robert A. Cliffe, U. S. Army Transportation Corps, and one-time member of the MCTC staff served as chairman of the afternoon session at which the following papers were presented:

"Allocation of Containers in a Trade Route," by F. Cesar Toscano, Sandberg-Serrell Corporation

"Cargo Handling Savings Short of Full Containerization," by F. S. Macomber, A. T. Kearney and Company

"Bio-Energetics of Longshore Work," by Frank C. Hale, University of California at Los Angeles

The symposium was preceded by the MCTC Research Correlation Conference, held on May 12, which provided an informal forum for a group of active researchers in the field of maritime transportation systems. Those present included representatives of governmental, industrial, and academic research activities. To insure informality and promote discussion, the Conference was limited to about 35 participants. Off-the-record roundtable discussions were held on a number of current and projected research programs.

RESEARCH ASSOCIATESHIPS IN MATHEMATICS

The Office of Naval Research (ONR) has announced the award of six postdoctoral research associateships in mathematics for the academic year 1959–60. These awards were made upon the recommendation of the Committee on Mathematics Advisory to ONR. The recipients of the research associateships are listed below, together with their fields of research and the institution making the appointment:

MICHAEL A. GERAGHTY (Ph. D., University of Notre Dame, 1959)
Topology—Northwestern University

CHUNG NIM LEE (Ph. D., University of Virginia, 1959)
Topological transformation groups—University of Michigan

DAVID B. LISSNER (Ph. D., Cornell University, 1959)
Algebra—Northwestern University

ELVIRA S. RAPAPORT (Ph. D., New York University, 1956)
Group theory—Columbia University

RIMHAK REE (Ph. D., University of British Columbia, 1955)
Lie algebras and groups—Columbia University

RICHARD C. SACKSTEDER (Ph. D., Johns Hopkins University, 1959)
Partial differential equations and differential geometry—Yale University

INDONESIAN ABSTRACTS

The first issue of *Indonesian Abstracts*, published by the Council for Sciences of Indonesia, appeared in July 1958. The journal is a quarterly designed to provide the outside world with English abstracts of current scientific Indonesian literature in the fields of the natural sciences, the social sciences, and the humanities.

Prior to this publication, little or nothing was known about scientific work being done in post-war Indonesia. As President Sarwono of the Council said in his foreword to the first issue, the journal constitutes "an attempt to remedy the situation." *Indonesia Abstracts* is distributed without charge to organizations or individuals directly associated with the Council for Sciences, as well as on an exchange basis with domestic and foreign scientific insitutions. All correspondence should be addressed to the Editors, Indonesian Abstracts, Council for Sciences of Indonesia, 11 Medan Merdeka Selatan, Box 250, Djakarta, Indonesia.

TENTH INTERNATIONAL CONGRESS INTERNATIONAL INSTITUTE OF REFRIGERATION

The Tenth International Congress of the International Institute of Refrigeration (IIR) will be held in Copenhagen, Denmark, August 19–26. In addition to the plenary sessions of the Congress, the following nine Technical Commissions of IIR will meet to discuss specially selected topics:

Commission I—Scientific problems regarding physics and thermodynamics of low temperatures.
Commission II—Heat transfer. Thermal properties of materials. Instrumentation. Insulating materials.
Commission III—Design, construction and operation of refrigeration machinery and air-conditioning plants.
Commission IV—Application of refrigeration to foods and agricultural produce.
Commission V—Cold storage warehouses and ice-making plants.
Commission VI—Application of refrigeration for purposes other than refrigeration of foods and agricultural produce.
Commission VII—Refrigerated transportation by land and by air.
Commission VIII—Refrigerated transportation by sea.
Commission IX—Education and Training.

The United States delegation to the Congress, appointed by Detlev W. Bronk, President of the National Academy of Sciences, consists of the following members and their alternates:

F. G. Brickwedde, Pennsylvania State University
J. E. Dube, Alco Valve Company
B. H. Jennings, American Society of Heating, Refrigerating and Air-Conditioning Engineers
R. C. Jordan, University of Minnesota
C. F. Kayan, Columbia University
W. T. Pentzer, U. S. Department of Agriculture

Alternates:

Paul R. Achenbach, National Bureau of Standards
M. J. Copley, U. S. Department of Agriculture
L. I. Dana, Linde Air Products Company
W. R. Woolrich, Middle East Technical University, Ankara, Turkey

CONFERENCE ON PROJECT PLOWSHARE

The annual conference planned by the Division of Earth Sciences for members and invited guests was held on May 2 at the Academy–Research Council building. This year the conference was devoted to a discussion of the background and various facets of the Atomic Energy Commission's Project Plowshare. This enabled scientists in the Washington area to learn some of the proposed uses of nuclear explosives and to discuss the attendant problems fully and informally.

The speakers, all from the Lawrence Radiation Laboratory of the University of California, and their topics were:

"Background of the Plowshare Program," by Edward Teller
"General Phenomenology of Underground Nuclear Explosions," by Gerald W. Johnson
"The Distribution of Radioactive Isotopes in Underground Explosions," by Roger E. Batzel
"Chemistry of Ground Water Contamination," by Gary H. Higgins
"The Immediate Plowshare Program," by Gerald W. Johnson

Because of the informal nature of the conference, no proceedings will be published.

VISITORS FROM UNESCO SECRETARIAT

The Academy–Research Council recently was host to two visitors from the Unesco Secretariat in Paris: Dr. V. Kovda, the newly appointed Director of the Natural Sciences Department of Unesco, was here for two days the latter part of May; and Dr. Michel Batisse, Head of the Arid Zones Unit of the Natural Sciences Department, who not only visited the Academy–Research Council but spent over a month visiting installations throughout the United States in an effort to obtain an over-all picture of arid lands research being conducted here.

On May 28 and 29, Dr. Kovda, a soil scientist, met with members of the Academy–Research Council and representatives of various governmental agencies associated with or having an interest in Unesco's activities in the field of science. On Thursday, May 28, the Office of International Relations arranged a luncheon in his honor in the Great Hall and also arranged for subsequent visits to the National Science Foundation, the Carnegie Institution of Washington, the U. S. Department of Health, Education, and Welfare, and a half-day tour of the Agricultural Experiment Station at Beltsville, Md.

The Office of International Relations planned a month-long itinerary for Dr.

Batisse, starting with a meeting with the Arid Zones Ad hoc Advisory Committee at the Academy–Research Council and including visits to the U. S. Departments of Agriculture and Interior and the U. S. Weather Bureau. After a tour of institutions in Colorado, Utah, California, Arizona, New Mexico, Kansas, and Florida dealing with various phases of arid zone research, Dr. Batisse returned to the Academy–Research Council for a final meeting with the Arid Zones Ad hoc Advisory Committee on May 19. At that time he summarized his observations, made evaluations, and suggested ways in which the United States can effectively cooperate in Unesco's Major Project on Arid Lands.

1960–61 FULBRIGHT COMPETITION

The Committee on International Exchange of Persons has announced that some 300 awards for university lecturing and advanced research will be offered for the 1960–61 academic year in the following countries: Austria, Belgium and Luxembourg, Denmark, Finland, France, Germany, Greece, Iceland, Iran, Ireland, Israel, Italy, Japan, The Netherlands, Norway, Spain, Taiwan, Turkey, and the United Kingdom (including colonial territories in Africa, the West Indies, and Asia). A substantial number of these awards will be in the fields of pure and applied sciences.

Application forms and a detailed description of available openings may be obtained from the Committee on International Exchange of Persons, Academy–Research Council. The closing date for receipt of applications is October 1, 1959.

COMMITTEE ON BASIC RESEARCH ADVISORY TO OFFICE OF ORDNANCE RESEARCH

Owing to the increasing demands for advisory services, the Committee on Basic Research Advisory to the Office of Ordnance Research (Army) has been enlarged and now consists of 33 members and the Chairman, R. E. Gibson, Director of the Applied Physics Laboratory, The Johns Hopkins University. Since the last announcement of committee membership, the following specialists have been appointed to represent the fields indicated:

Chemistry:

G. W. Wheland, University of Chicago, Organic chemistry

Engineering:

Renato Contini, New York University, Human engineering

Antonio Ferri, Polytechnic Institute of Brooklyn, Fluid dynamics

Edward Saibel, Rensselaer Polytechnic Institute, Friction lubrication

Samuel Seeley, Case Institute of Technology, Electrical engineering and acoustics

Mathematics:

William G. Cochran, Harvard University, Statistics and probability

L. H. Loomis, Harvard University, Abstract analysis

Antoni Zygmund, University of Chicago, Classical Analysis

Paul Olum, Cornell University, Topology and geometry

Physics:

W. P. Allis, Massachusetts Institute of Technology, Gaseous electronic phenomena

Malcolm H. Hebb, General Electric Research Laboratory, Solid state physics

Robert J. Maurer, University of Illinois, Solid state physics

Hardin M. McConnell, California Institute of Technology, Chemical physics

Robert G. Parr, Carnegie Institute of Technology, Atomic and molecular physics

STAFF APPOINTMENTS

The Disaster Research Group has announced the appointment of **George W. Baker** as Research Consultant. Dr. Baker received his Ph. D. degree in sociology and social anthropology from the University of North Carolina in June 1952. He has served as a research psychologist with the U. S. Air Force and before coming to the Academy–Research Council was team chairman with the Special Operations Research Office at American University.

The Division of Medical Sciences has appointed **Curt R. Schneider** a Professional Assistant for the newly inaugurated survey of needs in the field of tropical medicine under the direction of Willard H. Wright (*see* NEWS REPORT, Vol. IX, No. 1, pp. 5 and 12, 1959). Dr. Schneider received the doctorial degree in epidemiologic science from the University of Michigan in 1956 and held a U. S. Public Health Service Postdoctoral Traineeship in parasitology at the University of Puerto Rico.

Lt. Donald G. McQuarrie of the Medical Corps, U. S. Naval Reserve, was detailed to the Division of Medical Sciences on June 1 to serve as liaison officer with the Bureau of Medicine and Surgery and the Office of Naval Research. Dr. McQuarrie received his medical education at the University of Utah and had completed his internship and two years as Resident in Surgery at the University of Minnesota Hospitals when he was called to active duty. For the past few months he has been serving in the Submarine and Diving Medicine Branch of the Naval Medical Research Institute.

Dr. McQuarrie relieved **Lt. John E. Jones** of the Medical Corps, U. S. Naval Reserve, who has completed his military service and has been awarded a U. S. Public Health Service Traineeship in endocrinology at the Minneapolis Veterans' Hospital.

The Army Medical Research and Development Command has assigned **Maj. William S. Mullins** of the Medical Service Corps, U. S. Army, to the staff of the Armed Forces–National Research Council Committee on Bio-Astronautics. A graduate of the University of Texas with degrees in both English and journalism, Maj. Mullins has done graduate work in education at The George Washington University. His previous assignments have included a two-year tour of duty with the Atomic Bomb Casualty Commission in Japan, service with the 1st Cavalry Division and the Eighth Army Staff in the Korean War, and most recently as Congressional Liaison Officer in the Office of the Surgeon General.

The Office of International Relations has announced the appointment of **Eric R. Rude** as a Professional Associate. The Academy-Research Council has been asked to advise on the best use of science and technology in the Government's foreign aid programs in certain underdeveloped areas. Mr. Rude has been brought in to work with the special committees set up by the Academy to deal with these matters, for which administrative responsibility has been placed in the Office of International Relations. Mr. Rude was with the Division of International Affairs of the Atomic Energy Commission for several years. He is a geographer by profession and a graduate of Pennsylvania State University.

Richard Wiebe has just been appointed Assistant Director of the Office of Critical Tables. Dr. Wiebe received his Ph. D. degree in physical chemistry from the University of California at Berkeley in 1926. For the past 17 years he has served as Head of the Analytical, Physical Chemistry, and Physics Section of the Northern Regional Research Laboratory, U. S. Department of Agriculture, at Peoria, Ill.

RECORD OF MEETINGS

March	
1	Ad hoc Committee on Ultraviolet Light Study
2	Sanitary Engineering and Environment Discussion Group
	Committee on Science in Unesco
4	Special Committee Advisory to the Department of Commerce, *New York City*
	Federal Construction Council, Task Group on Underfloor Duct Distribution Systems
5	Special Committee on Highway Research Priorities, *Chicago*
	Committee on the Effects of Atomic Radiation on Oceanography and Fisheries
5–6	Committee on Ship Structural Design
6	Subcommittee on Personnel and Training
7	National Research Council Postdoctoral Board for the Natural Sciences
9	Special Moho Committee
	Committee on International Exchange of Persons
11	Committee on Oceanography
13	Prosthetics Research Board, Executive Committee, *Detroit*
	Advisory Panel to National Bureau of Standards Building Technology Division

March	
13	Panel on Manganese
14	Working Group on Environmental Studies of the North Atlantic, *New York City*
16	Advisory Committee on Cartography
	Subcommittee on Water Supply
17	Committee on Infectious Diseases and Chemotherapy
17–18	Committee on Ship Steel
18	Advisory Board on Quartermaster Research and Development, *Natick, Mass.*
	Committee on Fats and Oils
	Panel on Information in Space Biology Fields
19	Federal Construction Council, Task Group on Underground Heat Distribution Systems
19–21	National Research Council, Annual Meeting
20	Division of Earth Sciences, Annual Meeting
	Division of Mathematics, Annual Meeting
	Division of Mathematics, Executive Committee
	Division of Medical Sciences, Annual Meeting
	Division of Physical Sciences, Annual Meeting
22	Committee on Asia
23	Ad hoc Planning Committee for Seventh General Conference of Unesco
	Subcommittee on Atmospheric and Industrial Hygiene
	Committee on Ultraviolet Light Study
23–24	Committee on Soil and Water Conservation, *Chicago*
24	Committee on Animal Products, *Chicago*
	Federal Construction Council, Task Group on Soil Compaction
25	International Congress on Nutrition, Hospitality Committee
25–26	Building Research Advisory Board, Technical Studies Advisory Committee
26	Committee on Africa South of the Sahara
27	U. S. National Committee, International Union for the History and Philosophy of Science, *New York City*
	Maritime Cargo Transportation Conference, Board of Advisers
	Committee on Behavorial Sciences, *New York City*

March	
27	Advisory Committee on the Atomic Bomb Casualty Commission
	Committee on Atmospheric Sciences, *Chicago*
	Building Research Advisory Board, Review Committee for Design Criteria of Residential Slabs-on-Ground, *New York City*
30	National Advisory Committee for AASHO Road Test, Economic Data Panel, *La Salle, Ill.*
	Advisiory Board on Education
30–31	Subcommittee on Carcinogenesis
April	
1	Committee on Scope and Conduct of Materials Research
2	Conference on Jet-Compressor Theory and Experiments, *Natick, Mass.*
	Subcommittee on Thermal Factors in Environment, *Natick, Mass.*
	Committee on Cereals
	Committee on Infant Nutrition
	Ad hoc Committee on Research Problems of Mutual Interest and Concern to Users and Producers of Asphaltic Materials, *Chicago*
	Advisory Panel to National Bureau of Standards Atomic and Radiation Physics Division
	Subcommittee on Toxicology
3	Beef Conference Committee, *Kansas City, Mo.*
	International Congress on Nutrition, Women's Committee
3–4	Committee on International Anthropology, *Palo Alto, Calif.*
	Food and Nutrition Board
4	Committee on Protein Malnutrition
6	U. S. National Committee, International Union of Biological Sciences
	Building Research Institute Programs Committee, *Pittsburgh*
	Building Research Institute, Planning Committee for Fall Conference, *Pittsburgh*
	Building Research Institute, Advisory Committee on Publications, *Pittsburgh*
	Building Research Advisory Board and Building Research Institute Board of Governors, Joint Meeting, *Pittsburgh*
	Building Research Advisory Board, *Pittsburgh*
6–8	Armed Forces–National Research Council Committee on Vision
6–9	Second Coastal Geography Conference, *Baton Rouge*
7–8	Building Research Institute, Annual Meeting, *Pittsburgh*

April	
8	Armed Forces–National Research Council Committee on Hearing and Bio-Acoustics, Executive Council
	Federal Construction Council, Task Group on High Temperature Water Systems
	Building Research Institute, Plastics Study Group, *Pittsburgh*
	Building Research Institute, Building Operation and Maintenance Study Group, *Pittsburgh*
9	Armed Forces–National Research Council Committee on Vision and Committee on Hearing and Bio-Acoustics, Joint Executive Council Meeting
	Committee on Geography, Advisory to Office of Naval Research, *Baton Rouge*
	Committee on Food Stability, *Chicago*
	Advisory Panel to National Bureau of Standards Applied Mathematics Division
10	Advisory Panel to National Bureau of Standards Optics and Metrology Division
11	Committee on Veterans Medical Problems
13	Subcommittee on Neutron Measurements and Standards
14	Subcommittee on Sarcoidosis
	Federal Construction Council, Operating Committee
	U. S. National Committee, International Union of Biochemistry
	U. S. National Committee, International Union of Nutritional Sciences, *Atlantic City*
15	Committee on a National Atlas of the United States
	Highway Research Board, Department Chairmen and Staff
16	Ad hoc Advisory Committee on Arid Zones
	Subcommittee on Dog Nutrition, *Atlantic City*

April	
17	Facilities Committee for Air Research and Development Command
	Conference on Electrical Insulation, Executive Meeting
18	Panel on Information in Space Biology Fields
18–19	Medical Fellowship Board
20–21	Shelter Habitability Panel Laboratory Sub-Group
21	Institute of Laboratory Animal Resources, Governing Board
21–22	Building Research Advisory Board, Advisory Committee on Residential Building Sewers
22	Building Research Institute, Committee on Sandwich Panel Design and Criteria, *Cambridge, Mass.*
	U. S. National Committee, International Institute of Refrigeration
23	Building Research Committee, *New York City*
24	Advisory Panel to National Bureau of Standards Metallurgy Division
25	Committee for NATO Postdoctoral Fellowships
	Steering Committee on Africa South of the Sahara
26	National Academy of Sciences–National Research Council, Governing Board
27–29	National Academy of Sciences, 96th Annual Meeting
28	Agricultural Board, Executive Committee
	Highway Research Board, Subcommittee on Publications
28–29	Subcommittee on Measurements and Standards of Radioactivity
29	Subcommittee on Nuclear Constants
30	Committee for Research in Problems of Sex
	Subcommittee on Transfusion Problems

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Notice of Academy Meetings

NATIONAL ACADEMY OF SCIENCES

Autumn Meeting, Indiana University, Bloomington, Ind., November 16–18, 1959

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Governing Board, Washington, D. C., October 11, 1959

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—ARISTOTLE